

Current status of information literacy instruction practices in medical libraries of Pakistan

Midrar Ullah, MPhil (Library and Information Science);
Kanwal Ameen, PhD (Library and Information Science)

See end of article for authors' affiliations.

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Objectives: The research explored the current practices of information literacy (IL) instruction in medical libraries of Pakistan.

Methods: A semi-structured questionnaire was mailed to the head librarians of all 114 academic medical libraries in Pakistan. It investigated the types of IL instruction provided, topics covered, methods of delivery and assessment, level of integration in the curriculum, and level of collaboration with teaching staff.

Results: The study revealed that 74% of the respondents had offered some types of IL instruction in their institutions during the previous year, ranging from library orientation to research-level skills. IL instruction is typically only offered to new students or first-time library users or on demand. A majority of the respondents developed IL instruction programs

without faculty involvement. Librarians were primarily responsible for offering IL instruction in medical institutions. Face-to-face instruction in computer labs or lecture halls and individual instruction at reference desks were identified as the most common IL instruction delivery methods. The data indicated that oral feedback, written feedback, and searching in a computer lab were the most popular assessment methods that medical librarians used.

Conclusion: IL instruction activities in medical libraries of Pakistan are in their infancy. Medical librarians also lack systematic approaches to IL instruction.

Implications: Medical librarians need to develop educational partnerships with faculty for integrating IL instruction into the mainstream curriculum.

INTRODUCTION

Information literacy (IL) has been defined as “the ability to identify, locate, evaluate, organize, and effectively create, use and communicate information to address an issue or a problem” [1]. The Higher Education Commission (HEC) of and medical institutions throughout Pakistan have been providing large amounts of funds and other resources to provide print and online resources to medical faculty, students, and researchers free of cost. However, there is a serious need to improve understanding of the most effective way to make these sources accessible and useful to those who need them [2]. Gorman emphasized that the rapid expansion of information resources on the Internet makes it essential for people to be information literate [3]. International organizations such as the United Nations Educational, Scientific and Cultural Organization; the International Federation of Library Associations and Institutions (IFLA); the American Library Association; and the Chartered Institute of Library and Information Professionals (CILIP) have developed standards and special chapters to promote IL [4]. Library and information professionals are thought to have a key role in helping users to improve their ability to find and use information [5]. Hence, the provision of IL

instruction has become a professional obligation for those who work in all types of libraries in a fast-emerging knowledge society. This is true for medical librarians in Pakistan as well; they are required to offer IL instruction to their library users [6].

Medical education in Pakistan consists of a five-year curriculum after obtaining a higher secondary school certificate (a twelve-year program), followed by one-year house job (internship). Medical colleges offer the five-year curriculum for undergraduate medical education; while for postgraduate training, medical students enroll in medical institutes such as the College of Physicians and Surgeons of Pakistan (CPSP) or, for master and doctoral programs, in medical universities.

There were only 2 medical libraries in 1947 in Pakistan, both attached to medical colleges. Presently, there are more than 100 medical libraries, mostly attached to medical colleges (schools), medical universities, and postgraduate medical institutes. These are all headed by professional librarians, since the Pakistan Medical and Dental Council (PM&DC), a regulatory body of medical education, requires professional staff to “supervise the library and information services, and provide instruction in accessing resource[s] to the users” [6]. Medical libraries serve the students, faculty, and clinicians of the affiliated teaching hospitals. A recent study by Ullah and Anwar revealed that library and information services for medical professionals and patients in hospitals that are not affiliated with any academic medical institutions are almost nonexistent in



A supplemental appendix is available with the online version of this journal.

Pakistan [7]. Head librarians are responsible for IL training and orientation, as no instructional librarian positions currently exist in Pakistani medical libraries.

The concept of IL is quite new in Pakistan and is not well supported [2, 8]. The first time IL instruction was included in the library and information science (LIS) curriculum of the University of the Punjab was in 2008. In 2009, the Higher Education Commission (HEC) of Pakistan included a six-credit optional course on IL in the LIS curriculum [9]. However, IL has not yet found a place in the curriculum of all twelve LIS schools in Pakistan.

Sproles et al. examined 3,527 articles on library instruction and IL published from 2001–2010 and found that most of those were from the United States, but articles from Asia and Africa also appeared frequently [10]. User education is not a new subject in Pakistan; however, it lacks systematic approaches [11]. Ameen and Gorman considered IL an obstacle in the economic development of developing countries such as Pakistan. The authors suggested that information and digital literacy should be integral parts of the curriculum at all levels [5]. Bhatti surveyed 10 universities in Pakistan to evaluate their state of user-education programs and found that only 40% libraries offered formal user education programs to their users. Library orientation and guided tours for new entrants were the most frequently mentioned activities. She suggested that user education programs should be designed in accordance with the needs of library users. Bhatti also reviewed the literature to assess the state of IL instruction in university libraries of Pakistan. She found that university libraries did not have any formal IL policies. She proposed creating a national committee on IL composed of all stakeholders for improving the situation [12]. Mahmood discovered that students at the University of the Punjab had basic computer and Internet skills but lacked specialized searching skills [13]. Rafique also found that faculty members of the University of Lahore were not successful library users [14]. Batool and Mahmood recommended that IL instruction might be improved by providing proper learning facilities and infrastructure at the school level [15].

Little is known with respect to medical librarians' IL instruction practices in Pakistan. The research reported here aims to bridge this gap by identifying current IL instruction practices in medical libraries of Pakistan in general, as well as to explore differences between libraries at public and private sector medical institutions. These libraries differ in terms of the level of students and curriculum as well as the amount of funding provided.

The current study is designed to assist LIS schools and LIS associations that are responsible for the education and training of librarians in designing curriculum and training programs. It can serve as baseline study for Pakistan, and the results may be of assistance to accreditation bodies such as HEC and PM&DC.

METHODS

The descriptive survey method was used, following the lead of previous studies on this topic [12, 16–22]. A semi-structured questionnaire was prepared based on these prior studies. The questionnaire was reviewed by a panel of experts (four LIS faculty members, four IL experts, and four senior medical librarians) for content validation and was revised in response to their feedback. It was also pilot-tested on a group of medical librarians who were not part of the population. The suggestions of pilot-study participants helped in further refining the questionnaire. The questionnaire included eleven questions designed to answer the question: What are the current practices of IL instruction (course contents, methods of delivery and assessment, level of integration in curriculum, level of collaboration with teaching staff) in medical libraries of Pakistan? The questionnaire also requested demographic information for cross-tabulation purposes (Appendix, online only).

The questionnaire along with a stamped and self-addressed envelope was mailed (by post) to the head librarians of all 114 academic medical institutions recognized by PM&DC in August 2013. SPSS software was used to analyze the data, which were analyzed by frequency and percentage. Pearson's chi-square or Fisher exact tests (cases in which Pearson's chi-square was not valid) were applied to determine if there were significant differences in the practices of subpopulations.

RESULTS

Response rate

After continuous follow-up, 70 (61.4%) head librarians responded to the survey. During the follow-up process, it was determined that no professional librarians were employed in 3 of the medical libraries; clerical staff was running these libraries. Two head librarians refused to participate in the study. One questionnaire was discarded, as it was carelessly completed. Therefore, 69 (60.5%) usable responses from head librarians were analyzed.

Demographic information

The questionnaire was originally mailed to 114 head librarians, 58 (50.9%) of whom worked in the public sector, while the remainder (56, 49.1%) served in private medical institutions. The majority (81, 71.1%) of the head librarians were employed in medical colleges, 21 (18.4%) in postgraduate medical institutes, and 12 (10.5%) in medical universities.

Out of 69 respondents, 52 (75.4%) were males and 17 (24.6%) were females. A total of 31 respondents (44.9%) were from public sector medical institutions, and 38 (55.1%) were from private sector medical institutions. Forty-four (63.8%) respondents were employed in medical colleges, 14 (20.3%) in postgraduate medical institutes, and 11 (15.9%) in medical universities.

Table 1
Provision of information literacy (IL) instruction in different types of institutions

Sector	Provides IL instruction				Total	χ^2 value	Asymp. sig. (2-sided)	Cramer's V
	Yes		No					
	n	(%)	n	(%)				
Medical colleges	34	(77.3%)	10	(22.7%)	44	6.057	0.048*	0.296
Medical universities	10	(90.9%)	1	(9.1%)	11			
Postgraduate medical institutes	7	(50.0%)	7	(50.0%)	14			
Total	51	(73.9%)	18	(26.1%)	69			

* The difference is significant at the 0.05 level.

Post hoc chi-square tests results: medical colleges and medical universities (χ^2 (1)=1.023, $P=0.312>0.05$; phi=0.136); medical colleges and postgraduate medical institutes (χ^2 (1)=3.813, $P=0.051>0.05$; phi=0.256); medical universities and postgraduate medical institutes (χ^2 (1)=4.738, $P=0.030<0.05$; phi=0.435).

Information literacy (IL) instruction activities

The respondents were asked if they offered some kind of IL instruction in their institutions. Fifty-one (73.9%), the overwhelming majority of the respondents, replied "Yes" and 18 (26.1%) replied "No."

Twenty-two (71.0%) of 31 public sector head librarians reported providing IL instruction, compared to 29 (76.3%) of 38 head librarians in private sector medical institutions. This difference was not significant (χ^2 (1)=0.253, $P=0.615>0.05$, phi=0.061), indicating similarities in the overall availability of instructional activities in public and private sector medical libraries. However, there were significant differences among respondents employed in medical colleges, medical universities, and postgraduate medical institutes in the delivery of IL instruction (Table 1).

To further explore the difference between all possible pairs of the subpopulations and their IL instruction activities, three post hoc chi-square tests were run to examine differences between: medical colleges and medical universities, medical colleges and postgraduate medical institutes, and medical universities and postgraduate medical institutes.

Thirty-four (77.3%) out of 44 medical college libraries, 10 (90.9%) out of 11 medical university libraries, and 7 (50%) out of 14 postgraduate medical institute libraries reported providing IL instruction. The results from the 3 post hoc chi-square tests (Table 1) indicated that only the difference between medical universities and postgraduate medical institutes, in terms of offering IL instruction, was significant. A phi value of 0.435 indicated a moderate difference existed between medical universities and postgraduate medical institutes.

Types of information literacy (IL) instruction offered. The respondents who said they offered IL instruction in their institutions were asked to indicate the types of IL instruction they had provided in the previous year in order to determine the range of IL instruction offered. Respondents were asked to choose one or more of five types of IL instruction: library orientation, guided library tour, introductory information skills (e.g., catalog instruction, introduction to the library website), advanced information skills (e.g., database training, advanced Internet searching), and research-level skills (e.g., literature

Figure 1
Types of information literacy instruction offered (n=51)

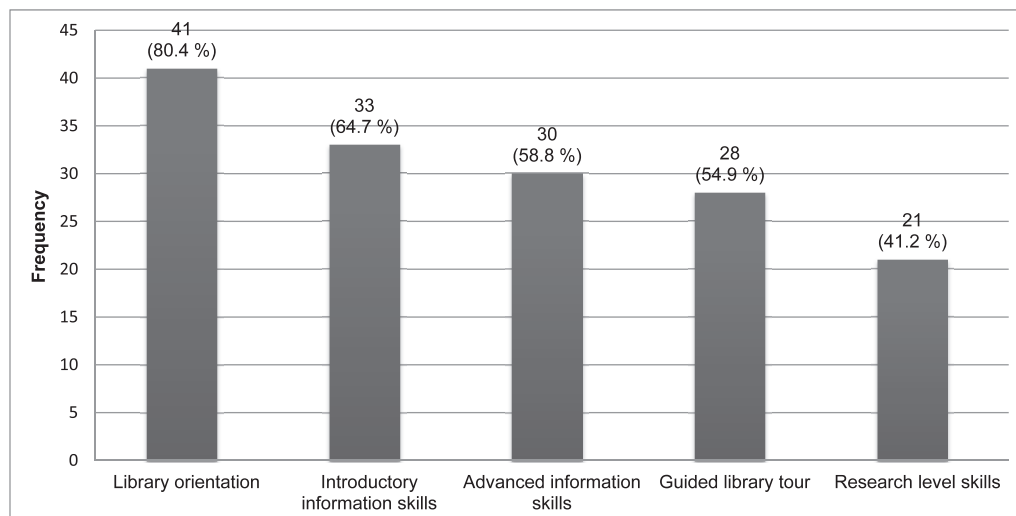


Table 2

Difference between types of institutions and types of IL instruction offered

S. no.	Types of IL instruction	Fisher's exact test value	df	Exact. sig. (2-sided)	Cramer's V
1	Library orientation	3.200	2	0.178	0.248
2	Guided library tour	1.387	2	0.489	0.165
3	Introductory information skills	3.530	2	0.201	0.262
4	Advanced information skills	8.879	2	0.009*	0.423
5	Research-level skills	10.231	2	0.004*	0.448

* The difference is significant at the 0.05 level.

Post hoc Fisher's exact tests results: Advanced information skills: medical colleges and medical universities ($P=0.012<0.05$; $\phi=0.296$); medical colleges and postgraduate medical institutes ($P=0.006<0.05$; $\phi=0.463$); medical universities and postgraduate medical institutes ($P=0.338>0.05$; $\phi=0.278$).**Research-level skills:** medical colleges and medical universities ($P=0.013<0.05$; $\phi=0.386$); medical colleges and postgraduate medical institutes ($P=0.045<0.05$; $\phi=0.313$); medical universities and postgraduate medical institutes ($P=1.000>0.05$; $\phi=0.065$).

searches and information management, reference styles, citation management software training, scholarly publishing, etc.).

Respondents offered a wide range of IL instruction (Figure 1), from library orientation to research-level skills. "Library orientation" was the most popular type of IL instruction offered, followed by "introductory information skills," "advanced information skills," and "guided library tour." Fewer respondents offered research-level skills. There were no significant differences in type of IL instruction between public and private sector institutions. However, there were significant differences between medical colleges, medical universities, and postgraduate medical institutes in terms of providing instruction in "advanced information skills" and "research-level skills" (Table 2). Further analysis revealed a significant difference between medical colleges and medical universities in the delivery of advanced information skills. A ϕ value of 0.296 indicated a minor difference existed between them. The difference between medical colleges and postgraduate medical institutes in delivery of advanced information skills was also significant. A ϕ value of 0.463 indicated a moderate difference between them. However, no significant difference was found between medical universities and postgraduate medical institutes (Table 2). More medical university libraries (9 out of 10, 90.0%) and postgraduate medical institutions

libraries (6 out of 7, 85.7%) reported providing "advanced information skills," compared to medical college libraries (15 out of 34, 44.1%).

There was a statistically significant difference between medical colleges and medical universities in delivery of research-level skills (Table 2). A ϕ value of 0.386 indicated a moderate difference existed between them. The difference between medical colleges and postgraduate medical institutes in delivery of research-level skills was also significant. A ϕ value of 0.313 indicated a moderate difference between them. However, no significant difference was found between medical universities and postgraduate medical institutes in delivery of research-level skills. More medical university libraries (6 out of 10, 60.0%) and postgraduate medical institution libraries (6 out of 7, 85.7%) reported offering "research-level skills," compared to medical college libraries (9 out of 34, 26.5%).

Topics covered in IL instruction programs. A list of 15 topics was presented to those respondents who indicated that they offered IL instruction. They were asked to check the specific skills addressed in their IL instruction programs. Space was provided to list additional topics if needed.

Seven of 15 topics addressed in IL instruction programs were mentioned by more than 50% of the respondents (Table 3). Eight topics were mentioned

Table 3

Frequency distribution of topics covered in IL instruction program (n=51)*

	IL topics	Frequency	Percentage
1	Introduction to library resources, services, and policies	46	90.2%
2	Online searching techniques	41	80.4%
3	Use of medical databases	40	78.4%
4	Use of Higher Education Commission (HEC) Digital Library	39	76.5%
5	Identification of their own information needs	37	72.5%
6	Use of search engines	37	72.5%
7	Evaluation of information	28	54.9%
8	Library website introduction	24	47.1%
9	Plagiarism awareness/ethical use of information	20	39.2%
10	Citation of information (referencing styles)	20	39.2%
11	Online public access catalog (OPAC)/library catalog introduction	17	33.3%
12	Copyright	16	31.4%
13	Scholarly publishing	15	29.4%
14	Theory and practice of evidence-based medicine	14	27.5%
15	Use of citation management software (EndNote, RefWorks, etc.)	14	27.5%

* Respondents could choose more than 1 option, so results will not add to 100%.

Table 4
Frequency distribution of IL instruction delivery methods (n=51)

	IL instruction delivery methods	Frequency	Percentage*
1	Face-to-face	44	86.3%
2	Individual instruction at the reference desk	36	70.6%
3	Workshops/seminars	21	41.2%
4	Printed training manuals	12	23.5%
5	Combination of online and face to face	5	9.8%
6	Online/web-based tutorials	2	3.9%

* Respondents could choose more than 1 option, so results will not add to 100%.

by 47.1%–27.10% of the respondents. An additional 8 topics (literature searching for systematic reviews, writing of technical abstracts, presentation skills, communication skills, information and communications technologies skills, effective use of social media, effective use of mobile technologies, and identification of Medical Subject Headings) were added to the list by respondents.

IL instruction recipients. Respondents were asked to indicate for whom they provided IL instruction programs. Fifty-one respondents answered this question. Forty-four (86.3%) respondents provided IL instruction to undergraduate students. This finding is to be expected, because the majority of respondents were from medical colleges, which largely have undergraduate medical students. Thirty-six of the respondents (70.6%) offered IL instruction for faculty, 30 (58.8%) for postgraduate students, and 22 (43.1%) for practitioners. IL instruction was also provided to paraprofessionals and staff (8 respondents, 15.7%), and the Sri Lankan dengue team (1, 0.02%) was mentioned by a respondent in the open-ended option for this question.

Approaches to providing IL instruction. The survey also questioned respondents about the mode or approach used to provide IL instruction at their institutions. Results showed that IL instruction was most commonly provided to first-time users (44 respondents, 86.3%), followed by “whenever asked to do so” (37, 72.5%). The other 2 options, “At specific time after the installation or acquisition of a new system or information sources” (16, 31.4%) and “IL is a required course for students” (13, 25.5%), were chosen less frequently.

IL instruction delivery venues. Results indicated that 24 (47.1%) respondents offered IL instruction in a computer lab. Twenty-two (43.1%) used a library training room or lecture hall outside the library for delivering IL instruction. It is interesting to note that 11 (21.6%) mentioned that they used the library reading room for this purpose in an open-ended option for this question.

IL instruction delivery methods. Respondents were asked to indicate the IL instruction delivery methods

Table 5
Frequency distribution of IL instruction assessment methods (n=34)

	IL instruction assessment methods	Frequency	Percentage*
1	Oral feedback	22	64.7%
2	Written feedback	16	47.1%
3	Assessment through practical searching in computer lab	11	32.4%
4	Assignment	10	29.4%
5	Short answers	7	20.6%
6	Collaborative learning exercise in class	4	11.8%
7	Quizzes	4	11.8%
8	Multiple choice questions (MCQs)	4	11.8%

* Respondents could choose more than 1 option, so results will not add to 100%.

used in their institutions. The most popular IL instruction delivery method was “face-to-face,” followed by “individual instruction at reference desk” and “workshops and seminars.” Respondents did not frequently select online or web-based tutorials (Table 4).

Assessment of IL instruction effectiveness. Thirty-four (66.7%) respondents reported that they assessed the effectiveness of their IL sessions. There were no differences in frequency of assessment between public and private institutions (χ^2 (1)=0.999, $P=0.318$; $\phi=0.140$) or among colleges, universities, and postgraduate institutions ($P=0.906>0.05$; Cramer’s $V=0.075$).

Assessment methods

Those who performed an evaluation were asked a follow-up question with eight options about the evaluation methods. Oral and written feedback were the most common approaches used to evaluate the effectiveness of IL instruction programs (Table 5). Only a few respondents used more formal assessment methods.

Integration of IL in the curriculum. Respondents were asked whether IL instruction was integrated into the curriculum. Thirteen (26.0%) of the 50 respondents responded “Yes,” and 37 (74.0%) responded “No.” The 13 respondents who indicated that IL instruction was integrated into the curricula of their institutions were asked at which level it was integrated and if the IL instruction was integrated as a credit or noncredit course. IL instruction was integrated in 9 medical institutions at the undergraduate level and in 12 institutions at the postgraduate level as noncredit courses. None of the institutions provided IL instruction as a for-credit course.

Librarian and faculty collaboration. To identify faculty involvement in the development of IL instruction programs, respondents were asked whether they developed IL instruction programs in collaboration with faculty. Surprisingly, only 40 respondents responded to this question. Of the 40, 18 (45.0%) responded “Yes” and 22 (55.0%) responded “No.”

Staff responsible for running IL instruction programs

Respondents were asked who had responsibility for the IL instruction programs in their institutions: librarians, faculty, or both faculty and librarians in collaboration. Thirty-three (66.0%) respondents mentioned that only librarians provided IL instruction programs, 17 (34.0%) indicated that librarians and faculty collaborated, and only 5 (10.0%) indicated faculty were solely responsible for providing the IL instruction programs at their institutions.

DISCUSSION

Survey results indicated that most of the medical libraries in Pakistan offered library orientation and introductory information skills. Fewer respondents provided instruction in research-level skills. Unfortunately, these basic programs are insufficient to support lifelong learning, critical or creative thinking, and problem solving, all of which require more well-developed skills and thus more extensive instruction in information retrieval [5]. IL instruction practices were found to be at a basic level. The authors have observed that the educational system in medical colleges in Pakistan is very traditional, and the absence of a research culture in Pakistan results in a low level of publication by faculty. Previous studies have reported very similar IL practices in other developing countries [16–22].

Results showed a moderate difference between medical universities and medical colleges, as well as between postgraduate medical institutes and medical colleges, in the delivery of advanced-level information skills and research-level skills. More medical librarians employed in medical universities and postgraduate medical institutes offered advanced-level information skills and research-level skills, compared to librarians at medical colleges. These results were expected as medical colleges mostly offer undergraduate medical education, which may not require “advanced-information skills” or “research-level skills,” whereas medical universities and postgraduate medical institutes offer postgraduate-level education, requiring students to use more advanced and research-level information skills. Medical librarians covered multiple content areas during IL instruction. Introduction to library resources, services policies, searching techniques, and use of medical databases were the most commonly covered areas. Few respondents reported addressing plagiarism, copyright, citation management, and evidence-based medicine. More attention needs to be paid to these areas, as the Association of College and Research Libraries (ACRL) standards state that the information literate student “understands many of the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally” [23].

Medical librarians indicated that they preferred traditional face-to-face instructional delivery in a

computer lab, lecture hall, or individual instruction at a reference desk over online and web-based tutorials using online settings. This might reflect the absence of the required information technology (IT) skills, support, and facilities in these medical institutions that are needed to develop such tutorials. Providing these medical libraries with the facilities needed to develop online tutorials would expand their ability to reach the students who might never have the opportunity to experience face-to-face IL instruction. Online or web-based tutorials can be used any time at any place [24]. Some respondents also offered IL instruction in the library reading room, possibly because libraries were mostly housed in a single room in medical colleges. IL instruction is typically only offered to new students or first-time library users or on demand. Only 26% of medical institutions had integrated IL instruction into the curriculum as a noncredit course. Integrating IL instruction into the curriculum cannot be done by the library alone. Medical librarians will need support from students, faculty, and administrators, which requires a sustained effort, negotiation, and communication [25].

Medical librarians used oral or written feedback to assess the effectiveness of their IL instruction sessions; few respondents used formal assessment methods. Assessment is important: IL instructors need to determine how effective their IL instruction programs are in terms of students achieving learning outcomes so that they can improve those programs. Assessment also provides evidence of effectiveness to faculty and administration, which can assist in obtaining monetary and policy support for IL instruction programs. The results demonstrated that most of the medical institutions lacked collaboration between librarians and faculty: only one-third of the respondents collaborated with faculty in their IL instruction programs. Many studies have demonstrated a lack of cooperation between faculty and librarians, and acknowledged the need for collaboration between them in order to enhance the teaching and learning process [16–22]. At the same time, findings also indicated that medical librarians were predominantly responsible for running IL instruction programs, and IL instruction seemed to be one of their core mandates. This mandate is also supported by international LIS associations such as ACRL, the Medical Library Association, the American Association of School Librarians, IFLA, and CILIP [4, 23, 26]. Aharony and Bronstein also found that Israeli academic librarians believed that teaching IL is more a library role than a faculty role [27].

Limitations

The study was confined to head librarians of academic medical libraries in Pakistan. The views of other stakeholders—such as management, faculty, and students—were not covered in this study.

CONCLUSION

IL instruction activities in medical libraries of Pakistan are in their infancy. Medical librarians need to conduct IL instruction programs in a more systematic and effective manner. There is a need to develop educational partnerships with faculty in order to integrate IL instruction into the mainstream curriculum, to teach it at a more in-depth level, and to provide better assessment. Future studies can explore how IL can be integrated into the medical curriculum and support the development of IL standards in conjunction with the HEC.

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AUTHORS' AFFILIATIONS

Midrar Ullah, MPhil (Library and Information Science), midrarullah2007@yahoo.com, Librarian and Literature Search Officer, Army Medical College, National University of Sciences and Technology (NUST), Pakistan, Abid Majeed Road, Rawalpindi, Pakistan 46000; **Kanwal Ameen, PhD (Library and Information Science)**, kanwal.ameen@gmail.com, Professor and Chairperson, Department of Library and Information Science, University of the Punjab, Lahore, Pakistan, 54000

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